

Redefining the Center of Gravity

By DALE C. EIKMEIER

It does not matter what Carl von Clausewitz said about the center of gravity (COG) in the 19th century. What matters is how we want to use the COG concept in the 21st century. Joint doctrine, specifically Joint Publication (JP) 5-0, *Joint Operation Planning*, is clear on the concept's purpose and utility. However, its explanation on how to achieve that intent is handicapped because of a reliance on confusing and outdated definitions. To meet its own intent, joint doctrine needs to break from Clausewitz and develop new definitions of the center of gravity and its critical factors based on the criteria of clarity, logic, precision, and testability. New definitions would then allow for selection and validation methods based on logic and objectivity. What is not useful is a continued sentimental devotion to 19th-century military theory.

Joint doctrine's intent for the COG concept is best stated in JP 5-0:

One of the most important tasks confronting the [joint force commander's (JFC's)] staff in the operational design process is the identification of friendly and adversary COGs. . . . The COG construct is useful as an analytical tool to help JFCs and staffs analyze friendly and adversary sources of strength as well as weaknesses and vulnerabilities. This process cannot be taken lightly, since a faulty conclusion resulting from a poor or hasty analysis can have very serious consequences, such as the inability to achieve strategic and operational objectives at an acceptable cost.¹

However, because definitions are not clear, logical, precise, or testable, and a doctrine does not provide a practical identification method, planners lack the understanding and focus needed to meet the intent of the COG concept.

Few debate the JP 5-0 description of COG value to campaign planning, so the concept is not the issue—the issue is the *definition*. I can think of no other term in military circles that generates so much debate. This debate alone is sufficient evidence that

doctrine is putting planners in an unusual position of not really knowing what something is, but agreeing that it has tremendous value. This absurd situation can only be remedied by changing joint doctrine's definition of the COG and its related critical factors.

The problem is twofold. The first is definitional; the second is methodological. Because the current doctrinal definition of the center of gravity lacks precision, it generates confusion and endless debates that are distractions from critical planning tasks. Second, doctrine offers no practical method to identify the COG. It does suggest a confusing system of systems (SoS) approach combined with a political, economic, military, social, infrastructure, and information nodal analysis. This SoS method may have utility as a targeting tool, but for COG identification, it just does not work in the real world.

Because of the complex and time-consuming SoS method, planners typically revert to an easier but terribly flawed definitional method. For any method to work, the definition must be clear, based on logic, precise, and lead to answers that can be objectively validated. Unfortunately, the current definition lacks these qualities, which is why it must be replaced. Otherwise, the lack of clarity, precision, logic, and testability will prolong the current and wasteful “debating” state, where anything that can be argued to fit the definition can be made a center of gravity.

the lack of clarity, precision, logic, and testability will prolong the “debating” state, where anything that can be argued to fit the definition can be made a center of gravity

The solution to the first problem requires a definition that fits the purpose and intent of JP 5-0, not a slavish devotion to Clausewitz's *On War*. After all, the Prussian did not hand down the COG concept from

Mount Sinai, and the intent of JP 5-0 should trump his widely confused and misinterpreted words.

Any revised definition that fulfills JP 5-0's intent should meet the following criteria:

- clarity: answers the question “what is it?” and is simple to understand with limited meaning
- based on logic: contains rules that allow for a valid inference
- precision: narrowly focused to exclude the extraneous
- testable: can be objectively tested using rules and logic.

Let's test the current definition from JP 5-0 against these criteria: “A COG can be viewed as the set of characteristics, capabilities, and sources of power from which a system derives its moral or physical strength, freedom of action, and will to act.”²

Clarity. If the definition generates more questions than answers, it is not clear. If we have to read and study a definition multiple times, it is not clear. Or if we have to deconstruct the definition and analyze the parts to gain understanding, it is not clear. If, after study, we lack certainty as to what is and what is not a COG, it is not clear. If there is a cottage industry in publishing articles on what the true meaning is, it is not clear. What is not clear from the definition is the fact that we do not know if COG in this context is a thing (noun) or a capability (verb). Does the COG provide strength to a system, or is it the strength? What characteristics (adjectives or adverbs) distinguish a COG from something else? The definition lacks clarity because it has no basis in logic.

Logic. A good definition provides some principles and criteria on which a valid inference can be made. For example, a cat is a mammal because it meets the criteria in the

Colonel Dale C. Eikmeier, USA (Ret.), is an Assistant Professor at the U.S. Army Command and General Staff College.

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2010		2. REPORT TYPE		3. DATES COVERED 00-00-2010 to 00-00-2010	
4. TITLE AND SUBTITLE Redefining the Center of Gravity				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) National Defense University Press, Joint Force Quarterly, 260 Fifth Ave., Bldg. 64, Fort McNair, Washington, DC, 20319-5066				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 3	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

definition of a mammal. Due to the joint definition's lack of logic, rather than using criteria, it uses vague examples and nebulous characteristics that obfuscate and confuse rather than clarify and enlighten. For example, JP 5-0 lists 12 characteristics, but these are neither required characteristics nor are they exclusive characteristics. So they are of marginal use for making a logical inference. According to the definition, a COG has capabilities, but what capabilities, or capabilities *to do what*? Again, it is difficult to make a logical inference as to what capability would merit a COG to be defined as such. Moral or physical strength, freedom of action, and will to act without a connecting purpose are just actions. The ability to act must be connected to a purpose; otherwise, there is no logic to the action.

Precision. When a definition lacks clarity and logic, it is difficult to achieve precision, and the joint definition has fallen into this trap. Clarity and logic allow for precision, which is necessary for identifying a COG and turning it into the useful analytical tool that was intended in JP 5-0. So in place of precision, joint doctrine can only offer examples:

*At the strategic level, a CoG could be a military force, an alliance, political or military leaders, a set of critical capabilities or functions, or national will. At the operational level a CoG often is associated with the adversary's military capabilities—such as a powerful element of the armed forces—but could include other capabilities in the operational environment.*³

These examples suggest that at the strategic level, the COG can be just about anything, and at the operational level, it is usually a military capability but still could be anything—not a very precise definition. To achieve precision, we must exclude things based on logical criteria. However, the joint definition attempts to achieve precision by providing the examples above to illustrate what is not clear or logical. Not being able to logically exclude the extraneous, the examples attempt to cover all of the bases, just in case something might be left out. These examples even include the “just in case” catch-all phrases, such as “a set of critical capabilities or functions” and “but could include other capabilities in the operational environment.” This attempt to include rather than exclude obscures the identification of the real COG and devalues the overall concept.

As mentioned above, due to a poor definition lacking clarity and logic, JP 5-0 lists

12 characteristics that can be associated with a COG:

- exists at each level of war
- mostly physical at operational and tactical levels
- is a source of leverage
- allows or enhances freedom of action
- may be where the enemy's force is most densely concentrated
- can endanger one's own COGs
- may be transitory in nature
- linked to the objective(s)
- often intangible in limited contingency operations
- can shift over time or between phases
- often depends on factors of time and space
- contains many intangible elements at strategic level.⁴

Notice the use of the qualifying words: *may, can, often, and mostly*. These word choices leave quite a bit of latitude. Any definition that cannot stand on its own but must use Justice Potter Stewart's “I know it when I see it” method needs to be redefined.⁵

the qualifying words may, can, often, and mostly leave quite a bit of latitude

Testable. Since the current definition lacks clarity, logic, and precision, it is impossible to validate or test a COG selection. This is why students and planners debate, guess, and argue, and eventually grow frustrated with what JP 5-0 wants to be: a useful analytical tool.⁶

Since the current definition fails the clarity, logic, precision, and testable criteria, it must be replaced with one that does not. Only then will the endless debates cease and will planners be able to focus on campaign planning assisted by the COG concept rather than being distracted by it.

To fix the definitional problem, I propose this definition: *The center of gravity is the primary entity that possesses the inherent capability to achieve the objective.*⁷

Let's test this definition against the above criteria.

Clarity. This proposed definition is a simple declarative statement of what a COG is. It is the entity that can achieve the objective. Unlike the joint definition, it is not a list

of characteristics or descriptions separated by commas. The words used in the proposed definition have limited meaning, unlike the phrase *a source of power*, which can have several meanings. Clarity is achieved, which then allows for logic.

Logic. This definition has two criteria built in that, if met, can lead to a valid inference. First, the COG is the primary entity, the key word being *primary*. Second, it has the capability to achieve the specified objective or purpose. The logic is *A (primary entity) + B (capability to achieve the objective) = COG*. Using these simple criteria, we can easily infer what is and what is not a COG. Note that the capability must be directly linked to what attains the objective. The COG is the primary possessor of that capability or power.

The logic is further illustrated by asking three questions: What is my objective? How can I achieve it (the required capability)? What do I need or have that can do it? The answer to the last question is the center of gravity. This logic then excludes other contenders, allowing for greater precision.

Precision. The clarity and logic of the definition allow for precision. Use of the word *primary* is meant to exclude the secondary, supporting, or extraneous. If something is secondary or supporting or even essential, it is a requirement, but it is not the COG. This will be discussed in more detail later. The COG is the primary doer; it has the capability required to achieve the objective. If an entity does not have that capability, it is not the COG, and the system needs to find or create one.

Testable. The logic in the definition provides for a validation method called the Doer and Used test.

Doer

- Only the center of gravity is inherently capable of achieving the purpose or objective.
- If something executes the primary action(s) (capability) that achieves the objective, it is the COG.
- The COG executes the action and uses or consumes resources to accomplish it.

Used

- If something is used or consumed to execute the primary action (capability), it is a requirement.
- If something contributes to, but does not actually perform, the action, it is a requirement, not a COG.

In the proposed definition, intangibles such as moral strength or public opinion cannot be COGs because they have no capability for action and require a tangible agent to perform an action. So how are intangibles accounted for? They are accounted for in the COG critical factors. But like the doctrinal definition of the COG, the definitions for the critical factors also need to be revised.

JP 5-0 states that planners should analyze COGs within a framework of three critical factors: capabilities, requirements, and vulnerabilities.⁸ This would be sound advice if it were not for joint doctrine's odd definition of *critical capabilities*.

In 1996, Dr. Joe Strange of the Marine Corps War College created the idea of critical factors and defined them as follows:

■ **Critical Capability:** primary abilities, which merit a Center of Gravity to be identified as such in the context of a given scenario, situation, or mission

■ **Critical Requirements:** essential conditions, resources, and means for a critical capability to be fully operative

■ **Critical Vulnerabilities:** critical requirements or components thereof that are deficient or vulnerable to neutralization, interdiction, or attack in a manner achieving decisive results.⁹

These factors and their definitions were a tremendous step forward in COG analysis because they created a logical hierarchy that helped separate the true COG, the *doer*, from other contenders, which may be requirements. Additionally, the factors provide planners insight on how to attack or defend a COG by showing what a COG does, what it needs to do it, and what is vulnerable. However, for some bizarre reason, joint doctrine significantly changed Dr. Strange's definition of critical capability. Here is the joint definition: "Critical Capability—a means that is considered a crucial enabler for a COG to function as such, and is essential to the accomplishment of the specified or assumed objective(s)."¹⁰

Dr. Strange, in his definition, refers to abilities, which are verbs. The joint definition refers to means and enablers, which can be thought of as things that are nouns. This ambiguity between abilities or things leaves room for confusion. If we believe that means and enablers are things, then the joint definition can be considered synonymous with the definition of critical requirements. One solution is to accept Dr. Strange's wording for

critical capability, which emphasizes *primary abilities* that cannot be confused with nouns and returns the focus to actions that accomplish the objective.

Fixing the definitions of both the center of gravity and critical capabilities is the first step toward achieving the intent of JP 5-0. The second is to provide a useful method for identifying the COG.

for some bizarre reason, joint doctrine significantly changed Dr. Strange's definition of critical capability

SoS nodal analysis, while a useful technique for providing insights into understanding a system, is not a practical method for identifying the COG and should be replaced with the easier to use "ends, ways, and means" method. Indeed, no method, no matter how detailed, will produce truly scientific solutions. However, a disciplined and easily understood process such as the ends, ways, and means method can more efficiently meet the intent of JP 5-0.

The best way to determine a center of gravity involves a holistic viewpoint and systems theory. Without it, COG identification is just guesswork. However, the systems theory covers a lot of ground, and it is easy to get lost in a system's networked forest of nodes and links. Arthur Lykke's strategic framework¹¹ offers a simple solution. The framework's three simple questions—What is the desired endstate? How can it be achieved? What resources are required?—are systems theory boiled down to its essential elements in support of COG analysis.

This is how it works. There are six steps, four to identify the COG and two for *critical* and *vulnerable requirements*:

■ **Step 1:** Identify the organization's desired ends or objectives.

■ **Step 2:** Identify the possible "ways" or actions that can achieve the desired ends. Select the way(s) that the evidence suggests the organization is most likely to use. Remember: Ways are actions and should be expressed as verbs. Then select the most elemental or essential action—that selection is the critical capability. Ways = critical capabilities.

■ **Step 3:** List the organization's means available or needed to execute the way/critical capability.

■ **Step 4:** Select the entity (noun) from the list of means that inherently possesses the critical capability to achieve the end. This selection is the center of gravity. It is the doer of the action that achieves the ends.

■ **Step 5:** From the remaining items on the means list, select those that are critical for execution of the critical capability. These are the *critical requirements*.

■ **Step 6:** Complete the process by identifying those critical requirements vulnerable to adversary actions.

What this method provides is a simple and clear process for the identification and selection of a COG and the ability to differentiate between a true COG and other candidates that are actually *critical requirements*. This method with its objective rationale contributes to the intent of JP 5-0 by avoiding wasteful and pointless debates.

Joint doctrine is clear on the concept's purpose and utility. However, it currently lacks a sound basis for achieving its own intent. If adopted, the proposed definition herein, combined with the ends, ways, and means COG identification method, would provide campaign planners a real analytical tool that fulfills the doctrinal intent. **JFQ**

NOTES

¹ Joint Publication (JP) 5-0, *Joint Operation Planning* (Washington, DC: The Joint Staff, December 26, 2006), IV-8.

² Ibid.

³ Ibid., emphases in original.

⁴ Ibid., IV-9, figure IV-2.

⁵ Justice Potter Stewart made famous the phrase "I know it when I see it" when attempting to describe a threshold of obscenity in *Jacobellis v. Ohio* (1964). It has since become a colloquial expression used when something cannot easily be defined or is subjective. See Paul Gewirtz, "On 'I Know It When I See It,'" *Yale Law Journal* 105 (1996), 1023-1047.

⁶ JP 5-0, IV-8.

⁷ The use of the word *primary* is attributed to Joe Strange and Richard Iron, *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can All Speak the Same Language*, Perspectives on Warfighting, no. 4, 2^d ed. (Quantico, VA: Marine Corps Association, 1996), ix.

⁸ JP 5-0, IV-12.

⁹ Strange and Iron.

¹⁰ JP 5-0, IV-12.

¹¹ Arthur F. Lykke, Jr., ed., *Military Strategy: Theory and Application* (Carlisle, PA: U.S. Army War College, 1998).